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Client Matter: 7295/43

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:	)	
	)	
Wlodek Mandecki	)	EXAMINER: Fredman
	)	
SERIAL NO: new application	)	GROUP ART UNIT 1655
	)	
FILED: herewith	)	
	)	
FOR: METHOD OF DETERMINING THE SEQUENCE OF NUCLEIC ACIDS EMPLOYING SOLID-PHASE PARTICLES CARRYING TRANSPONDERS	)	

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to examination on the merits, please enter the following amendments:

IN THE CLAIMS

Please cancel claims 1-15 and add the following new claims:

--16. A method to determine the sequence of a target nucleic acid in a sample comprising the steps of:

(a) providing at least one solid phase particle comprising a transponder which is (i) a transponder which is a monolithic integrated circuit which can transmit via electromagnetic radiation an index number stored within said integrated circuit; and (ii) an oligonucleotide probe

attached to the surface of the integrated circuit, wherein said probe is capable of binding to a nucleic acid,

(b) contacting said solid phase particle with said sample;

(d) denaturing nucleic acids in the sample mixture;

(e) hybridizing the nucleic acids in the sample mixture, whereby, if present, said target nucleic acid sequence specifically hybridize to said oligonucleotide probe, forming a complex attached to said solid phase particle;

(f) analyzing the solid phase particle to detect the presence of complex attached to said solid phase particle;

(g) decoding said index number encoded on the solid phase particle to which the complex is attached.

17. The method of claim 16, wherein (a) the monolithic integrated circuit comprises a photocell and (g) the decoding is done after the circuit is activated for radio transmission of data by light.

18. The method of claim 17, wherein the scanner device is a flow cytometer or flow fluorometer.

19. The method of claim 18, wherein said flow cytometer or flow fluorometer are modified by:

(a) adjusting the size of a flow chamber to allow for flow of said solid phase particles,

(b) placing an antenna in the vicinity of said flow chamber that is capable of receiving an electromagnetic signal from the monolithic integrated circuit,

(b) connecting said antenna to hardware that is capable of amplifying and decoding the signal.

20. The method of claim 16, wherein the complex is labeled with a fluorophore.

21. The method of claim 20, wherein the fluorophore is covalently bound to the target nucleic acid.

22. The method of claim 20, wherein said fluorophore is incorporated into the oligonucleotide probe immobilized on the solid phase support.

23. The method of claim 22, wherein said fluorophore is incorporated into the oligonucleote probe immobilized on the solid phase support by a chain extension labeling procedure with a DNA polymerase.

24. The method of claim 23, wherein the chain extension reaction is performed with at least four dye-labeled deoxynucleotide triphosphates, each dye-labeled deoxynucleotide triphosphate having a different fluorescence emission spectrum from the others.

25. A method of determining a sequence of a target nucleic acid thought to contain a plurality of subsequences, comprising the steps of:

(a) introducing into a sample at least two populations of solid phase particles, each particle having (i) a transponder which is a monolithic integrated circuit and (ii) an oligonucleotide probe corresponding to one of the subsequences attached to its surface, wherein a first population has a different oligonucleotide probe sequence than a second population and wherein said transponders in the first population are encoded with a different identification than said transponders of the second population;

(b) denaturing nucleic acids in the sample;

(c) hybridizing said oligonucleotide probe to nucleic acids in the sample which are of complementary sequence, forming complexes;

(d) analyzing the particles to detect the presence of complexes; and

(e) decoding the transponder to which the complex is bound to determine the sequence of the probe.

26. The method of claim 25, wherein the solid phase particle comprises at least three populations, each particle having (i) a transponder which is a monolithic integrated circuit and (ii) an oligonucleotide probe corresponding to one of the subsequences attached to its surface, wherein each of the three populations has a different oligonucleotide probe sequence from each other and wherein each of the populations is encoded with a different identification than the transponders of the other populations.

27. A scanner device comprising:

(a) a chamber for solid phase particles having active groups and transponders attached to their surface;

(b) a fluorometer for measuring the surface fluorescence from said solid phase particles in said chamber;

(c) an antenna for receiving the radio frequency signal emitted by said solid phase particles in said chamber, said antenna being located in the proximity of said chamber and being connected to a radio frequency signal amplification and analysis system.

28. The device of claim 27, further comprising a flow system for solid phases particles.

29. The device of claim 28, further comprising a laser as a light source that induces the fluorescence of the solid phase particles.

30. A flow cytometer of flow fluorometer, comprising:

(a) a flow chamber whose size allows for the flow of solid phase particles having active groups and transponders attached to their surface, wherein said transponder is a monolithic integrated circuit comprising a photocell, wherein said transponder produces an electromagnetic signal when a voltage is induced on said photocell;

(b) an antenna in the vicinity of the flow chamber, said antenna being capable of receiving an electromagnetic signal from the monolithic integrated circuit;

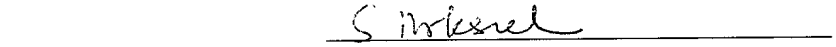
(c) hardware connected to the antenna which is capable of amplifying and decoding the electromagnetic signal.--

REMARKS

Claims 16-30 are pending in this application.

Applicants submit that the present application is now ready for examination on the merits.

Respectfully submitted,



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